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publication of Professor Cajori's latest research on "The History of the Logarithmic and Exponential Concepts."

Notwithstanding this proposed enlargement of the Monthly and the doubling of its cost of production, due to the employment of the best available service in mathematical printing, the subscription price will remain at Two Dollars per year. This is made possible only by the subsidy contributions mentioned above, and it is done with the hope that the subscription list may speedily grow to such proportions as to make the journal self-supporting.

Renewals and new subscriptions should be made payable to the Treasurer, B. F. Finkel, Springfield, Mo.

Contributed articles and official correspondence should be addressed to the Managing Editor, H. E. Slaughter, 5548 Monroe Avenue, Chicago, Illinois, while all problems and solutions should be sent, for the present, to B. F. Finkel, Springfield, Mo.

The Monthly will soon issue an index of Volumes I-XIX, which will render accessible the large number and variety of contributions already published in this journal. Back numbers can be supplied at 25 cents each, and single volumes at two dollars and fifty cents each. No complete sets of the MONTHLY are available, many of the numbers being out of print. All correspondence relating to back numbers should be directed to B. F. Finkel. S.

Having gotten behind one number, we are obliged to combine two numbers in one that we may get the December number out on time and thus have the way clear for the January number, which is to come out under the new organization. F.

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## BOOKS.

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*The ABC of the Differential Calculus.* By William Dyson Wansbrough, Author of the "Portable Steam Engine: Its Construction and Management;" "The Proportions and Movement of Slide Valves;" "Modern Steam Boilers;" etc. Third Edition. 16mo. Cloth, xii+148 pages. Price, \$1.50. New York: D. VanNostrand Co.

The author attempts to give the beginner an understanding of the Calculus by beginning with its most simple concepts. His illustrations are so simple and the details carried out so fully that any one ambitious enough to desire an insight into one of the most interesting of all mathematical subjects can readily gain such insight by perusing this book. F.

*A Manual of Laboratory Exercises in Physics.* By Frederick R. Gorton, B. S., M. A., Ph. D., Professor of Physics, Michigan State Normal College. 8vo. Cloth, xv+166 pages. New York: D. Appleton & Co.

In this little book is set forth a number of simple experiments in mechanics, sound, heat, light, and electricity and magnetism. F.

*Differential and Integral Calculus.* An Introductory Course for Colleges and Engineering Schools. By Lorrain S. Hulburt, Collegiate Professor of Mathematics in the Johns Hopkins University. 8vo. Cloth, xviii+481 pages. New York: Longmans, Green & Co.

This volume of the Calculus is divided into six books, as follows: Book I, treats of the differential calculus; Book II, of the integral calculus; Book III, introduction to analytical geometry of three dimensions, Book IV, functions of more than one argument; Book V, theorems of Taylor and MacLaurin, integration of rational fractions, and envelopes; Book VI, an introduction to ordinary differential equations.

The various topics of the Calculus discussed in this book are treated with great clearness and without undue complexity of notation; the problems have been carefully selected, some of them from the older texts and many of them have been created by the author himself. The publishers have been very fortunate in presenting the book in a very attractive style as to type and diagrams. F.

*Daytime and Evening Exercises in Astronomy.* For Schools and Colleges. By Sarah Francis Whiting, Sc. D., Whitin Observatory, Wellesley College. 8vo. Cloth, xiv+104 pages. New York, Boston, and Chicago: Ginn & Co.

It is hoped that this little book will stimulate an interest in the study of astronomy, and that we shall again find a large number of students in our colleges demanding courses in this oldest and one of the most inspiring of the sciences. F.

*New Analytical Geometry.* By Percy F. Smith, Professor of Mathematics in the Sheffield Scientific School of Yale University, and Arthur Sullivan Gale, Ph. D., Professor of Mathematics in the University of Rochester. 8vo. Cloth, x+342 pages. New York, Boston, and Chicago: Ginn & Co.

This book holds an intermediate place between the authors' *Introduction to Analytical Geometry* and the *Elements of Geometry*. The method of treatment is the same as that pursued in the two previous books. Those teachers who have found the *Elements* too exhaustive and the *Introduction* too limited will be glad to have this book, which will satisfy them in every particular. F.

*Plane Geometry.* By William Belz, A. M., Vice-Principal and Head of the Department of Mathematics in the East High School, Rochester, New York, and Harrison E. Webb, A. B., Head of the Department of Mathematics in the Central Commercial and Manual Training High School, Newark, New Jersey, with the editorial coöperation of Percy F. Smith, Professor of Mathematics in the Sheffield Scientific School of Yale University. 8vo. Cloth, x+332 pages. Price, \$1.00. Boston, New York, and Chicago: Ginn & Co.

The authors' apology for adding another text to the long list of existing geometrical text-books is to effect a compromise between the extreme demands of certain ultra progressives and the equally untenable position of the stand-patters. To this end they have written this text with the following features: (1) A preliminary course followed by the demonstrative course; (2) The demonstrative course built up not only in a topical, but also in a psychological order; (3) Methods embodied in the text aiming to make pupils independent of the printed page; (4) Equal consideration to various types of exercises; (5) An extensive but not excessive list of applied problems; and (6) Providing a minor and a major course. A student who has the mastery of this text will be well equipped for the practical problems which he may meet in life. F.

*Elements of Plane Trigonometry.* High School Edition. By Robert E. Moritz, Ph. D. (Nebraska), Ph. N. D. (Strassburg), Professor of Mathematics, University of Washington. Small 8vo. Cloth, viii+315 pages. Price, \$1.00. New York: John Wiley & Sons.

This book, we are told, is an effort on the part of the author to bring about a more perfect adjustment of the teaching of trigonometry with the teaching of the subjects on which it rests, and with the progress of the arts and sciences to which it applies. The book justifies the author's claim. F.

*A History of the Theories of Aether and Electricity* from the Age of DesCartes to the Close of the Nineteenth Century. By E. T. Whittaker, Hon. Sc. D. (Dublin); F. R. S.; Royal Astronomer of Ireland. New York and London, England: Longmans, Green & Co. 8vo. Cloth, xix+475 pages. Price, \$3.00.

The scope of this splendid work may be inferred from its table of contents. The first chapter treats of the theory of the æther in the seventeenth century; chapter II, Electric and magnetic science, prior to the Introduction of the Potentials; chapter III, Galvanism, from Galvani to Ohm; chapter IV, The luminiferous medium, from Bradley to Fresnel; chapter V, The æther as an elastic solid; chapter VI, Faraday; chapter VII, The mathematical electricians of the middle of the nineteenth century; chapter VIII, Maxwell; chapter IX, Models of the æther; chapter X, The followers of Maxwell; chapter XI, Conduction in solutions and gases, from Faraday to J. J. Thompson; chapter XII, The theory of æther and electrons in the closing years of the nineteenth century.

In the treatment of some of the subjects, vector analysis is used. To make the book readable to those unfamiliar with vector analysis, the author has introduced at the beginning a page of vector notation. This work will be of inestimable value to the teacher of physics. It was prepared by an able and eminent writer on physical and mathematical subjects, a fact insuring reliability and accuracy in statement and discussion. F.

*Laboratory Studies in Chemistry.* By Robert H. Bradbury, A. M., Ph. D., Head of the Department of Science in the Southern High School, Philadelphia. 8vo. Cloth, ix+129 pages. New York and Chicago: D. Appleton & Co.

This manual covers the various syllabi which teachers preparing students for college have to consider, and requires simple apparatus and generally inexpensive material. F.

*A Shorter Geometry.* By C. Godfrey, M. V. O., M. A., Head Master of the Royal Naval College, Osborne; formerly Senior Mathematical Master at Winchester College; and A. W. Siddons, M. A., late Fellow of Jesus College, Cambridge; Assistant Master at Harrow School. 8vo. Cloth, xxii+301 pages. Price, 80 cents. Cambridge: The University Press. G. P. Putnam's Sons, American Agents.

The plan of this book presents the subject in three stages, as follows: First, introductory work concerned with fundamental concepts; Second, discovery of fundamental facts of geometry, by experiment and intuition; and, Third, subsequent deductive development of the propositions. The book is beautifully printed on good paper, and handsomely bound. The authors are neither ultra-radical nor ultra-conservative. They clearly recognize the weakness of many of the modern methods as well as those of former times. The book is pedagogically wholesome. F.

*Mathematical Wrinkles.* For Teachers and Private Learners. Consisting of Knotty Problems; Mathematical Recreations, Answers and Solutions; Rules of Mensuration; Short Methods; Helps, Tables, Etc. By Sam I. Jones, Professor of Mathematics in the Gunter Biblical and Literary College, Gunter, Texas. 12mo. Half Leather, viii+321 pages. Price, \$1.65.

This book ought to be in the library of every teacher who has to teach any of the mathematical subjects in high schools, academies, or country schools. It contains a vast amount of useful and interesting material which such teachers ought to know, and with which they can often arouse interest and stimulate enthusiasm in their classes. It is a very regrettable fact that the larger per cent of our teachers who teach mathematics have little vital interest in the subject, and this fact is manifested by the extreme poverty of their libraries, not only in mathematics but in other subjects as well. Teachers who have not enough interest in their subjects to keep themselves informed on what is going on in this rapidly progressing world, had better give their places to others who have a higher ambition than merely making a living. Let the teacher of elementary mathematics buy a copy of this book. It will do you good. It contains problems, solutions, quotations from mathematicians, puzzles, etc. F.

*Practical Descriptive Geometry.* By William Griswold Smith, M. E., Assistant Professor of Descriptive Geometry and Kinematics, Armour Institute of Technology. 8vo. Cloth, ix+208 pages. New York: McGraw-Hill Book Company.

The author of this book, while recognizing the indisputable excellence of many of the text-books on Descriptive Geometry, feels that many of these excellent treatises are only useful as reference books; others are incomplete in essentials; still others are faddish, emphasizing certain features and treating others inadequately; while even the best convey only a slight idea of the practical value of the subject. Keeping these defects before him, we believe he has written a book that is accurate, practical, and teachable. F.

*Essentials of Calculus.* By E. J. Townsend, Ph. D. (Göttingen), Professor of Mathematics, University of Illinois, and G. A. Goodenough, M. E. (Illinois), Associate Professor of Mechanical Engineering, University of Illinois. 8vo. Cloth, x+355 pages. Chicago: Henry Holt & Co.

The average college student and students of technical schools will find their needs quite well met in this book. The work is based on the theory of limits, and the usual division of the subject into differential and integral has been pretty generally disregarded. This text will meet the demands of a large number of teachers in our colleges and technical schools. F.

*Gravitation.* By Frank Harris, B. A. (Oxon), Late Executive Engineer, and Associate M. Inst. C. E. 8vo., xi+107 pages. Price, \$1.00. New York: Longmans, Green & Co.

The author presents, in this volume, a theory as to the nature of gravitation. He begins his discussion with an inquiry concerning the motion of a massless spherical shell in an incompressible, frictionless fluid of unit density. He next considers the motion of two spheres in an infinite fluid. His discussion, in which he uses mathematical reasoning freely, is interesting and instructive. F.

*Complete School Algebra.* By Herbert E. Hawkes, Ph. D., Professor of Mathematics in Columbia University; William A. Luby, A. B., Head of the Department of Mathematics, Central High School, Kansas City, Mo.,

and Frank C. Tuton, Ph. B., Principal of Central High School, St. Joseph, Mo. 12mo Cloth, x+507 pages. Price, \$1.25. Boston and Chicago: Ginn & Co.

"The 'Complete School Algebra,' which includes between the covers of a single volume—with the necessary adaptation and abridgment—all the material of the authors' 'First Course in Algebra' and 'Second Course in Algebra,' is designed for those schools which find a one-book course best suited to their needs.

"The first twenty-three chapters contain the greater portion of the work usually taken up during the first year. Then follows the review material, each topic being given a broader and more advanced treatment than is permissible in first year work. New matter is used throughout, and many new applications are given in order to make a fresh and inviting appeal to the student. In the remaining chapters those advanced topics considered necessary by the best secondary schools are included.

The Hawkes, Luby, and Touton Algebras are marked by freshness and sanity of method. Wealth of illustrative material, correlation with arithmetic, geometry, and physics, prominence given the equation, emphasis on checking, and extensive work with graphs are a few of the features. These algebras—in a one-book and a two-book series—offer an arrangement of ideal flexibility in their adaptation to the needs of different schools."

*Lectures on the Theory of Functions of Real Variables.* Volume II. By James Pierpont, LL. D., Professor of Mathematics in Yale University. 8vo. Cloth, xiii+645 pages. Price, \$5.00.

In the compilation of this second volume, the author has rendered the American mathematician an invaluable service and has added to American Mathematical literature a most creditable and monumental work

The present volume comprises seventeen chapters treating the following subjects in order: Point Sets and Proper Integrals; Improper Multiple Integrals; Series; Multiple Series; Series of Functions; Power Series; Infinite Products; Aggregates; Ordinal Numbers; Point Sets, Measure; Lebesgue Integrals; Fourier's Series; Discontinuous Functions; Derivatives, Extremes, Variation; Sub- and Infra-Uniform Convergence; and Geometric Notions.

Pierpont's two volumes together with Hobson's treatise on the same subject present a fairly complete discussion of all that is known on the Theory of Functions of a Real Variable at the present time.

The publishers are to be congratulated for the very excellent style of printing and binding adopted in this work. F.

*Syllabus of Mathematics.* A Symposium compiled on the Teaching of Mathematics to Students of Engineering. Accepted by the Society for the Promotion of Engineering Education at the Nineteenth Annual Meeting held at Pittsburgh, Pennsylvania, June, 1911. 8vo. Cloth, 136 pages. Price, 75 cents. Ithaca: Office of the Secretary.

The Society feels that this report should be of value to teachers of mathematics in showing them what are considered fundamentals for engineering subjects and to indicate to teachers of engineering the preparation which they may reasonably expect their students to have had. It should also serve as a reference syllabus for students or engineers who wish to systematize their knowledge of mathematics. F.